IN THE SPECIFICATION:

Please replace paragraph [0023] with the following amended paragraph:

[0023] The valve member 170 first comprises a piston 170' movable within the valve chamber 161. The piston ~~170~~ 170' is a longitudinal shaft that sealingly resides within the valve body 160 above the seat 172. The piston 170' has a proximal end 170a at a first end of the valve body 160, and a distal end 170b that terminates above the seat 172. In the arrangement of Figure 1, the piston 170' is made of two separate bodies -- a movable shaft 108, and a valve rod 109 connected to the movable shaft 108. However, it is understood that the piston 170' may be a unitary piece.

Please replace paragraph [0026] with the following amended paragraph:

[0026] A magnetic member 104 is placed within the valve body 160. The magnetic member 104 is concentrically disposed around a portion of the upper shaft 108. The magnetic member 104 is fabricated from a magnetic material, such as iron, iron/cobalt alloys, iron/nickel alloys, or other suitable materials. A solenoid coil 102 is positioned in parallel with the shaft 108. The solenoid coil 102 may comprise one or a plurality of coils wrapped around the shaft 108. The solenoid coil 108 and the magnet 104 operate together to move the valve member 170 between its open and closed positions.

Please replace paragraph [0028] with the following amended paragraph:

[0028] As noted above, the diaphragm 111 may either be biased in an open or a closed position. Where the diaphragm 111 is normally open, actuation of the piston 170' may be by urging the magnet 104 and connected shaft 108 downward. This causes the diaphragm 111 to move downward and to seat. In this way, inlets 162 and 164 are closed. A lower shoulder ~~170b~~ 170c is fabricated along the piston 170' for mechanically engaging the magnet 104. Where the diaphragm 111 is normally closed, actuation of

the valve member 170 may be by urging the solenoid 102 and connected shaft 108 upward. This causes the diaphragm 111 to move upward. As the diaphragm 111 is moved upward, it raises off of the valve seat 172. In this way, inlets 162 and 164 are selectively opened. An upper shoulder ~~170a~~ 173 is fabricated along the piston 170' for mechanically engaging an upper magnet 107. In this respect, optional magnetic members 105, 106, and/or 107 may be disposed about the solenoid coil 102 to increase the drive force of the magnetic flux of the solenoid coil 102. These additional magnets would be fixed to the coil 102.

Please replace paragraph [0031] with the following amended paragraph:

[0031] Returning to Figure 1, the valve assembly 100 is in its open position. It can be seen that the diaphragm 111 is away from the valve seat ~~170~~ 172 to allow the in-flow of a reactant from the reactant inlet 162 or the in-flow of a purge gas from the purge inlet 164. Gases are allowed to enter the valve chamber 161, where they flow out through the outlet 166. From there, gases flow into the substrate processing chamber body.

Please replace paragraph [0032] with the following amended paragraph:

[0032] In a closed position, the diaphragm 111 is in contact with the valve seat ~~170~~ 172 to prevent the in-flow of a reactant from the reactant inlet 162. In certain preferred embodiments, in its closed position the diaphragm 111 does not block the in-flow of the purge gas from the purge inlet 164, through the valve chamber 161, into the outlet 166, and out to the substrate processing chamber. As shown in Figure 1, the valve chamber 161 may further comprise a groove 172' formed in the valve body 160 below the valve seat 172 so that the purge inlet 164 and the outlet 166 remain in fluid communication whether the diaphragm 111 is in a closed position or an open position. The groove 172' may be annular in shape as shown, or may be any suitable shape. As a consequence, in one aspect the three-port valve body 160 allows for a constant purge of the valve chamber 161. Those of skill in the art will then appreciate that there is less particle

formation from residual materials remaining in the valve chamber 161 due to the continuous purge.

Please replace paragraph [0034] with the following amended paragraph:

[0034] The biasing force of the spring 115 may be adjusted to reduce the force applied to the valve rod 109 when the diaphragm 111 moves from an open position to a closed position. Thus, the velocity of the valve rod 109 and the impact force between the diaphragm 111 and the valve seat 172 is reduced. In a countervailing consideration, the force of the spring 115 should be large enough to ensure an adequate seal between the diaphragm 111 and the valve seat 172 in a closed position. Preferably, the leakage across the diaphragm 111 and the valve seat ~~170~~ 172 is about 1×10^{-9} sccm or less when the seal is tested against vacuum to atmosphere.

Please replace paragraph [0037] with the following amended paragraph:

[0037] The surface area of the valve seat 172 is preferably increased in order to disperse the impact force between the diaphragm 111 and the valve seat 172. Increasing the surface area of the valve seat 172 may include increasing the internal diameter and/or the width of the ~~diameter~~ diaphragm 111.

Please replace paragraph [0039] with the following amended paragraph:

[0039] The two-port valve body 160' of the valve assembly 100' includes a valve chamber 161' in fluid communication with two ports -- a reactant inlet 162' and an outlet 166'. In an open position, the diaphragm 111 is off of the valve seat ~~172'~~ 172 to allow the in-flow of a reactant from the reactant inlet 162'. The reactant gas flows into the valve chamber 161', through the outlet 166', and into the substrate processing chamber body as described with Figure 1 above. In a closed position, the diaphragm 111 is in contact with the valve seat 172 to prevent the in-flow of a reactant from the reactant inlet 162'. The use of a two-port valve body 160' allows for a reduced amount of

reactants to be used since the reactants are not diluted by a constant flow of purge gas in comparison to a three-port valve body.

Please replace paragraph [0043] with the following amended paragraph:

[0043] In the arrangement shown in Figure 4, the valve assembly 100 is biased in its closed position. This means that when no current is applied through the connector 101, the piston 170' is in its closed position. When current is delivered through the connector 101, the piston 170' moves to its open position. When the piston 170' is moved from an open position to a closed position, the current at time 402 is shut off to the solenoid coil 102 so that the spring 115 will move the diaphragm 111 towards the valve seat 172[[, 172']]. Before the diaphragm 111 reaches the valve seat 172, [[172',]] a short pulse of current 414 is applied at time 404 to the solenoid coil 102 to reduce the velocity of the piston 170'. A reduction in the velocity of the piston 170' results in a reduced impact force of the diaphragm 111 against the valve seat 172[[, 172']]. However, if too large a pulse of current is applied, the solenoid coil 102 will cause the diaphragm 111 to move away from the valve seat 172[[, 172']]. Because the elastic force of the spring 115 does not stay constant over time, and because of the difficulty of timing a pulse of current for valves having a short response time, the pulse of current 414 is turned off prior to the diaphragm 111 contacting the valve seat 172[[, 172']]. This ensures adequate sealing between the diaphragm 111 and the valve seat 172[[, 172']]. Thus, a current 414 acts as a dynamic break of the diaphragm 111 of Figures 1 and 2.

Please replace paragraph [0044] with the following amended paragraph:

[0044] The valve assembly 100, 100' may optionally include diaphragm position indicators to directly or indirectly determine the position of the diaphragm 111. This ensures that the diaphragm 111 is moving between an open position and a closed position so that no pulses of reactants or cycles are missed. In one embodiment, the current output of the driver 180 may be measured to determine if there is a short in the ~~line~~ electrical connector 101 between the driver 180 and the solenoid coil 102. In

another embodiment, a gauge 190 (seen in Figures 1 and 2) may measure the pressure in the gas line between the reactant source and the reactant inlet 162, 162'. The gauge 190 provides a way of determining whether pressure in the gas line is building up when the diaphragm 111 is in a closed position and whether the pressure in the gas line is being released when the diaphragm 111 is an open position. In still another embodiment, a mechanical amplifier may use mechanical means of determining the position of the diaphragm 111. In yet another embodiment, a sensor, such as a magnetic sensor or a laser, may be used to determine the position of diaphragm 111.

Please replace paragraph [0046] with the following amended paragraph:

[0046] In one example, the valve assembly 100, 100' may be used with the chamber lid described in U.S. Patent ~~Application Serial~~ Publication No. 2003/0116087 ~~10/032,293~~ entitled "Chamber Hardware Design For Titanium Nitride Atomic Layer Deposition," filed on December 21, 2001, which is incorporated by reference in its entirety to the extent not inconsistent with the present disclosure. The valve assembly 100, 100' may also be used with the chamber lid as described in U.S. Patent ~~Application Serial~~ No. 6,878,206 ~~10/016,300~~ entitled "Lid Assembly For A Processing System To Facilitate Sequential Deposition Techniques," filed on December 12, 2001, which claims priority to U.S. Provisional Application Serial No. 60/305,970 filed on July 16, 2001, which are both incorporated by reference in their entirety to the extent not inconsistent with the present disclosure. The valve assembly 100, 100' may also be used with the apparatus disclosed in U.S. Patent ~~Application Serial~~ No. 6,916,398 ~~10/032,284~~ entitled "Gas Delivery Apparatus and Method for Atomic Layer Deposition," filed on December 21, 2001, which claims benefit of United States Provisional Patent Application Serial Number 60/346,086, entitled "Method and Apparatus for ALD Deposition," filed October 26, 2001, which are both incorporated by reference in their entirety to the extent not inconsistent with the present disclosure. The valve assembly 100, 100' may also be used with other suitable chambers.